

Circusion Acft Modeler July 72

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ALTITUDE AIRCRAFT NOW FLYING IN NASA-SPONSORED EARTH RESOURCES AIRCRAFT PROJECT. "AT ALTITUDE, GOING AS FAST AS IT'LL GO, IS JUST ABOUT AS SLOW AS IT'LL GO." //

Standing within a hundred feet of a Pratt & Whitney J-75 going full-bore is a thrill you really can afford to miss. But mounted inside a Lockheed U-2 that's about to STOL in its own inimitable fashion, who cares about a busted eardrum? Short field performance? You betchum, Red Rider. Departing at 10,000 feet-the-first-minute, U-2s don't encourage long "good-byes," and U-2 pilot Bob Ericson on his way to work is-out of sight.

Since being mustered out of the Air Force in April 1971, two Lockheed U-2Cs, decked out in brand-new civies, have been flying out of Moffett Field (Mountain View) California. On "permanent temporary loan" to NASA's Ames Research Center, the U-2s, now designated N708NA and N709NA, carry out a variety of scientific experiments. Complimenting three other NASA aircraft based in Houston, Texas—a Lockheed P3A Orion, a Lockheed C-130B Hercules and a Convair RB-57F—the NASA-Ames aircraft were introduced into an already existing Earth Resources Aircraft Project. In preparation for the future Earth Resources Technology Satellite, the U-2s augment the high altitude capabilities that were needed.

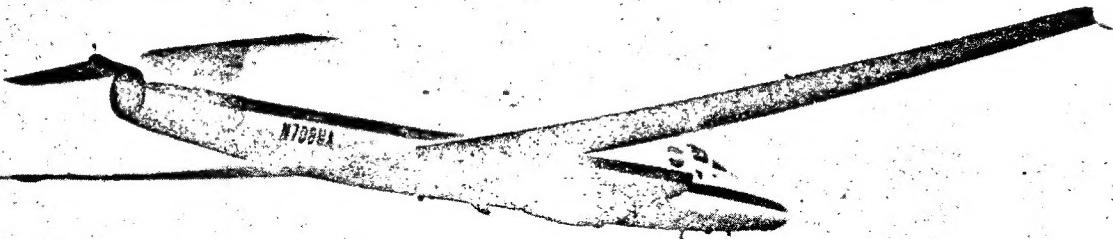
Engaged in the remote sensing of data, all the NASA aircraft are contributing towards establishing a basis of experience in data collection, interpretation, cataloguing and dissemination before the ERTs satellite becomes operational.

By simulating the satellite's eighteen-day cyclical coverage, the U-2s fly over five control areas chosen for their particular ecological idiosyncrasies. Because of the unique situations each test site presents, the areas covered are: the entire Chesapeake Bay region of the eastern U.S.; a 25,950 sq. mi. section around Phoenix/Tucson, Arizona; and (because of the proximity and diversity it offers) California's northern coast to Lake Tahoe, Nevada; the San Francisco Bay Area and California's prolific agricultural Central Valley region including the entire Los Angeles Basin. Data gained from the flights is available free to requesting federal, state and local agencies.

Since we on the ground often can't "see the forest for the trees," high-altitude photography in this instance functions as a learning tool for scientists to study and promote the general health and well-being of the Earth. Somewhat like the Intensive Care Unit of your local hospital, the current physiological status of the "patient" is systematically by various specialists. Ideally, for example,

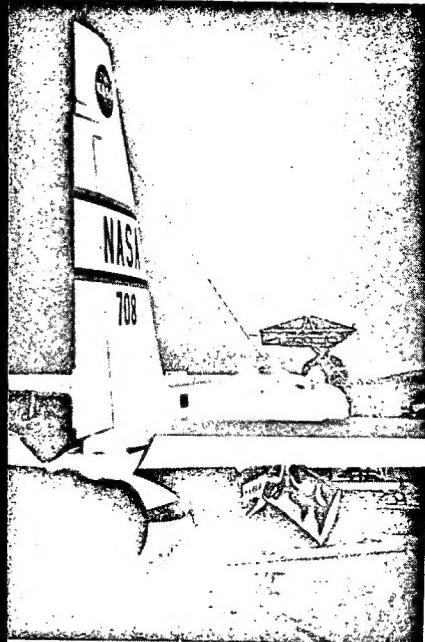
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NASA
708



Every view of this unique plane suggests a big glider. As it flies at over 45,000 ft., it needs lots of wing and tail areas.

Rear-view details show tail surfaces fairings, air brakes and tail pipe clearly for the scale builder. Photo by Miller.

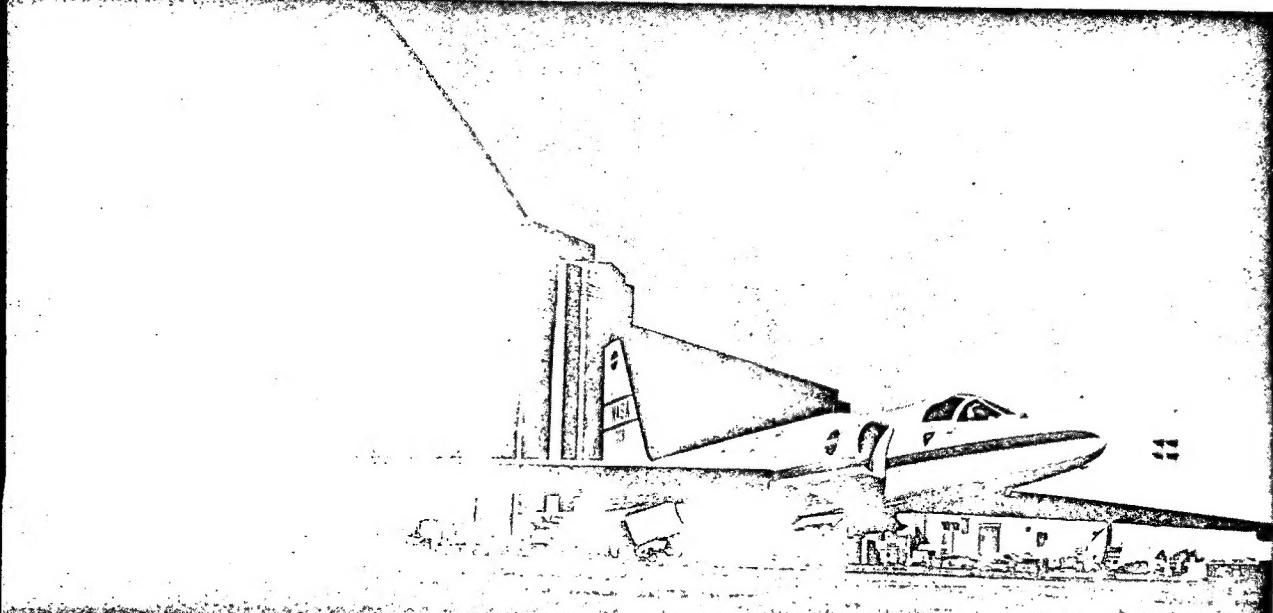


should the patient be threatened by an encroaching attack of corn blight through its mid(west)section, the Department of Agriculture can immediately notify farmers in the infected area.

It's precisely this sense of immediate purpose and the possibilities of future good that's noticeable in all the operations crew at NASA-Ames. Shortly after the April 2, 1971 budgetary approval was given the NASA-Ames portion of the project, the flight operations crew became more than mere ciphers on a piece of paper.

In Plant 42 at Lockheed's Palmdale, California facility, the Lockheed mechanics permanently assigned to the two fifteen-year-old "vets," began the rejuvenation. Meanwhile, up at Moffett Field, NASA Project Manager Marty Knutson gathered together the necessary ground handling and data facility personnel and equipment. By June 3, when the "08" and "09" flew into

(Continued on page 90)



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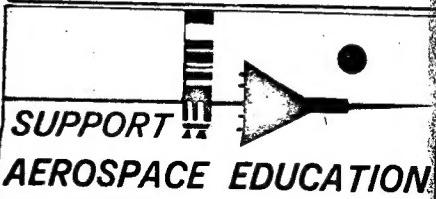
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finish can be applied. For additional strength, you may want to cover the model with either heavy silkspan or silk. My finish consisted of several coats of clear dope over the bare balsa which were sanded lightly. I then applied two coats of Hobbypoxy filler thinned down, then wet sanded with 320 paper. Next came a coat of clear Hobbypoxy also lightly wet sanded. Hobbypoxy color paint was then applied with an air brush—light gray for fuselage and wing bottom, top of the wing, yellow with a red band and black wingwalks, and a red band around the nose. Insignia decals and other markings were added before a final coat of clear Hobbypoxy was applied all over. It's also a good idea to fuel-proof the inside of the engine compartment—slop in Hobbypoxy clear especially in the corners. Now add the wheels, install the engine and you should be ready to go. Per the AMA rules for Class I Carrier, the control lines need to be .015" dia. and 60 ft. long when measured from the center of the handle to the center of the model. Until you get familiar with the model, avoid full-power takeoffs. With a hot 40 she really jumps off the ground.



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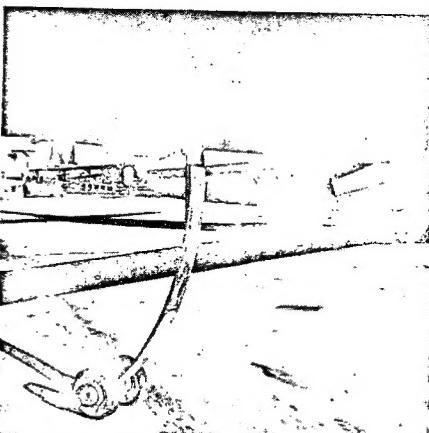
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everyone else. Each is dependent on the other. Each is interested and participates in the outcome. Often the pilots and the mechanics will study the day's photographs along with the data crew, since in reality they all participate in the operations and planning.

As Knutson says of the Lockheed pilots, "...and if they weren't motivated for the project—not just flying this airplane, the kind of work we hope to do for the country, mind you—we couldn't survive, because we're asking them to do a lot more than just fly an airplane."

What's it like to fly the N708NA or



Part of landing gear system, these are dropped before takeoff run starts. Front tires are non-steerable, only the tiny dual rears are steerable. The U-2 likes to ground loop all too easily. Photo by Miller.

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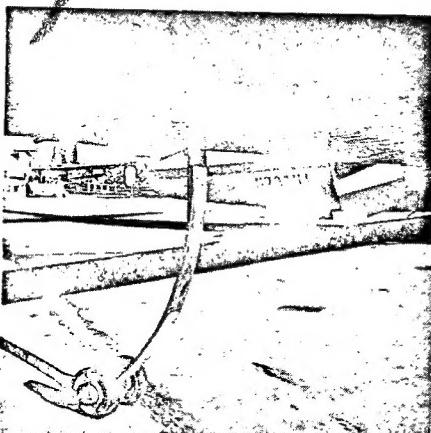
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the N709NA? They're slightly different. Each individual U-2 is an individual. Since they were hand-built, there are slight differences."

"Do you talk to 'em?"

"Oh no. We just sit there quietly and do our job."

"As a pilot's airplane, how is it?"

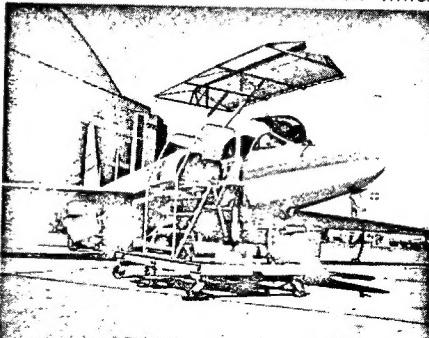
"Very exciting really. After that, when you're doing your work—if all systems are behaving—it's very pleasant and quite easy."

"Can you relax?"

"No. Not really. The airplane is quite a straightforward airplane. Quite simple. You've seen the inside of the cockpit. It's not modern. It's not 'state of the art,' if you will. But it's quite a simple, straightforward device. As long as you abide by the basic rules, it's quite an easy airplane to fly...."

Born in the brain of Lockheed's legendary Kelly Johnson during the early Fifties, a prototype Utility-2 airplane is reported to have been begun in January 1955. Successfully flight-tested in August 1955, the aircraft entered into limited production to specific requirements. Said to have been built to have a life span of no longer than eighteen months, obviously later models of the aircraft were structurally strengthened to increase their durability factor. The additional weight forced an engine upgrading (originally P&W J-57) and resulted in better aircraft performance.

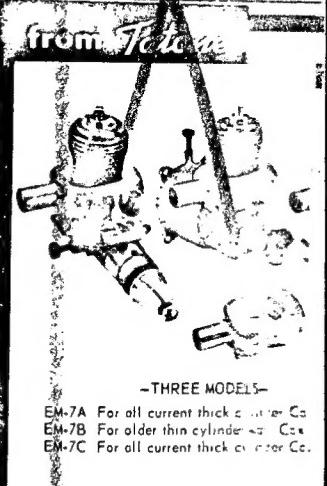
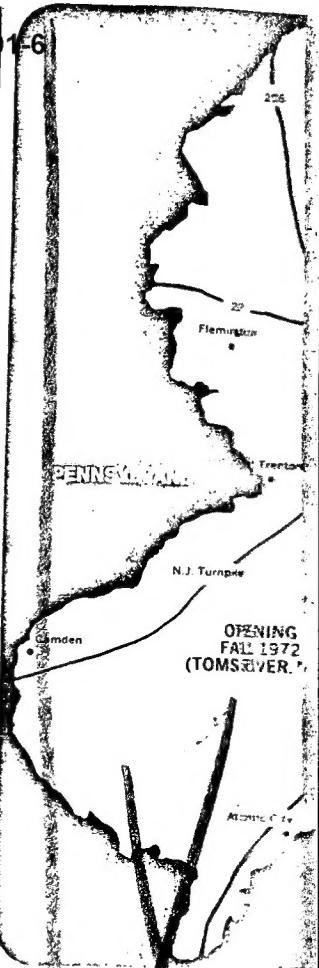
They basically have a glider configuration, for executing a "tight" 180° at 65,000 feet "there are sixteen miles



Necessary ground support equipment includes shade canopy. Pilots don't like to sit in cockpit on the ground as air conditioning works from the engine.

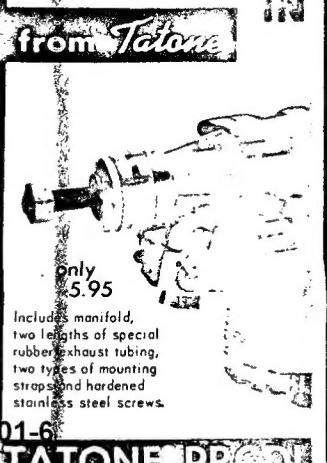


Pre-flight check pilot Jim Barnes readies the up in the personnel van. Note outside rear-view mirror. Photo by Miller.



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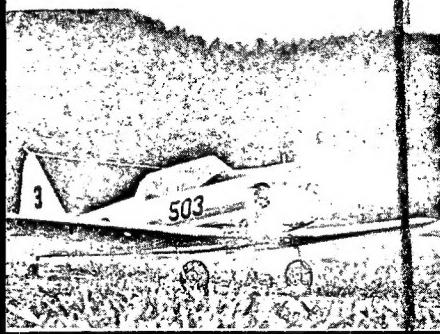
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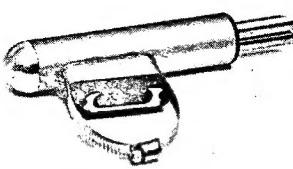
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The Second Coming (continued from page 91)

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by the way, the "Z," then, is not exactly what you would call "aerobic." Also, the differences between mach buffeting and stall-out tend to keep one alert. At altitude, going as fast as it'll go, is just about as slow as it'll go. Thus, having so narrow a flight margin, "it can bite you if you get outside its flight envelope. You've gotta mind the store!"

"Wet" wings and bicycle gear can make landing a hassle. The aircraft was designed so that towards the end of its landing roll, the fuel-heavy wing falls down. Prior to landing, NASA flight crew trucks stand by to run alongside and, as soon as the aircraft slows down enough, the crew re-insert droppable "pogos" underneath the wings to prevent its flopping over. But it's a matter of pilot and crew pride not to allow the wings to touch the ground. It's a matter of crew pride to "get there" before that happens. It's a matter of pilot pride to have the aircraft sashay past the crew trucks before the built-in metal wing skids scrape along the runway.

In the final moments before landing, the pilot will fly close to stall speed to determine his lateral CG. Then, using a cross transfer pump, he will transfer the right amount of fuel from one wing to the other. If he's got the airplane in perfect balance, he can "go into his landing roll and come to a dead stop. It's just there. Like a teeter-totter. Perfectly balanced. Fuel weighs six lb. a gallon, and he's got it right-down-to-the-gallon!" Now you know no self-respecting maintenance crew is going to allow that kind of arrogance.

Chaperoned Free Flight

(continued from page 22)

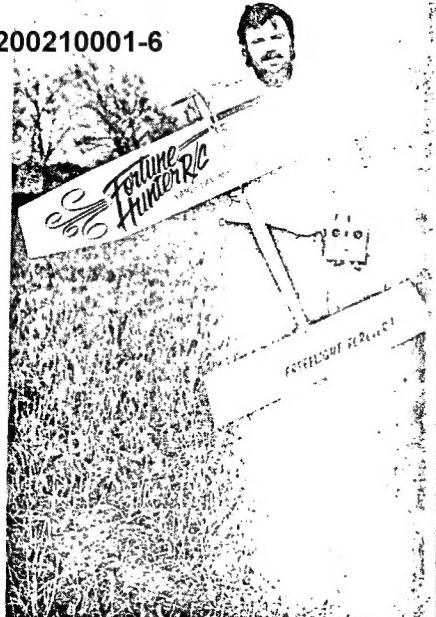
which is bound to benefit normal FF activity as well, since many of the components will be interchangeable between pure and RC FF.

Undoubtedly RC FF has all the appeal needed to become very popular. It should draw fliers from all ranks, including present RC fliers who recognize fun and a challenge when they see it. FF'ers who try it will be rewarded with the knowledge that their sport has a new lease on life.

Rules, Frequencies and Conversion

Rules to govern future competition should be kept simple and they should emphasize duration as the deciding variable. In other words, no bonus points awarded for spot landing, hunts, etc.

The problem of already crowded frequencies in RC is undeniable. It is intended that RC FF will use the 27.255 MHz spot frequency. This channel is not normally useable for RC due to interference, hand-held transmitters, certain FCC limitations, etc. However, a new concept which provides as many as 32 commands on one frequency may provide a solution and thus completely avoid interfering with present RC channels. The radio system requirement



Author with model. Lettering on MonoKo was done by Tom Peadon using bullet enamel.

that later rules will specify will describe the physical size, weight, frequency and channel operation, and permit only two operating functions. Any manufacturer can produce the airborne unit for the activity, meeting only these requirements. How each manufacturer achieves the requirements will be up to him. Cost of the airborne unit will be low but the transmitter will probably be club-operated.

Several FF kits could be converted to two-channel RC with extensive modifications required only on the fuselage. The Starduster 900 and 600, the Galaxy 585, the Witch Doctor 800, and the ABC Scrambler are the most likely choices. A safe way to go about converting all of these designs would be to first reduce the dihedral angles by 5 percent and lower pylon height by 7 percent. Rudder area of the Starduster should be doubled. The Witch Doctor and ABC Scrambler should have about 50 percent more rudder area. The rudder of the Galaxy 585 should be moved aft of the stab and doubled in area. In all cases, the fuselage would have to be widened to accommodate the receiver and batteries. A one- or two-inch nose extension will be required to retain CG location with the added tail weight of the pushrods and control horns. The Fortune Hunter control system should work fine on all of the above designs, and the rudder flap area should be retained at about 2 to 3 sq. in. The Starduster 900 might even put a few 12-foot RC sailplanes in the shade when it comes to sheer glide.

Those interested in building RC FF airplanes should feel free to write me in care of AAM if assistance is needed.

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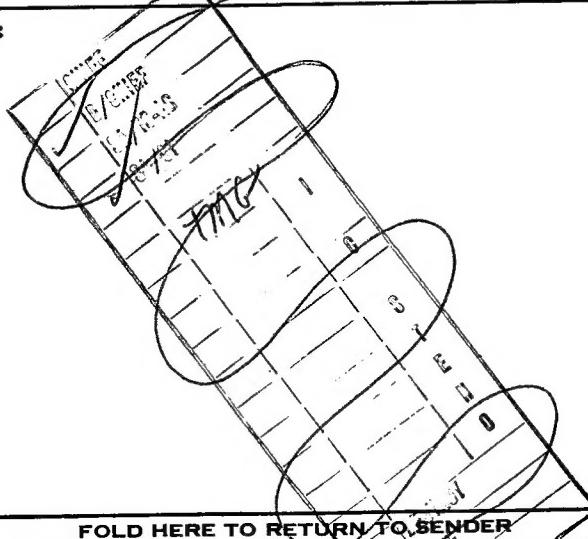
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